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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/608,384	06/27/2003	Jeffrey W. Carr	CARR-01000us4.002	7970

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EXAMINER
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VINH, LAN

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 02/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/608,384

Applicant(s)

CARR, JEFFREY W.

Examiner

Lan Vinh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 62703.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Claim Objections***

1. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Misnumbered claims 11-49 been renumbered 8-39.

The applicants are also required to provide the US Patent number and the issue date listed on page 1 of the specification

### ***Double Patenting***

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-39 rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-24, 31, 33-54 of U.S. Patent No. US 6,660,177 in view of Seo et al (US 6,534,921).

Claims 1-39 of the instant claimed invention meet all the limitations of claims 1-24, 31, 33-54 of U.S. Patent No. US 6,660,177 except the limitation of placing the workpiece in a plasma processing chamber including a plasma torch. Seo discloses a method for removing residual metal in plasma jet system comprises the step of placing the workpiece in a plasma processing chamber including a plasma jet/torch (col 5, lines 49-51)

Thus, one skilled in the art at the time the invention was made would have found it obvious to add the step of placing the workpiece in a plasma processing chamber as per Seo to the claimed inventions to produce claims 1-24, 31, 33-54 of U.S. Patent No. US 6,660,177 because Seo discloses that it is understood, of course, that the plasma jet system is enclosed within a chamber (col 5, lines 50-51).

The following table will compare the claims between US 6,660,177 and the instant claimed inventions

Instant claimed inventions	US 6,660,177
1-7	1-7
8-20	12-25
21-39	31, 33-39, 42-54

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-12, 16-20, 35, 37 are rejected under 35 U.S.C 102(b) as being anticipated by Fleming et al (US 5,000,771)

Fleming discloses a method for manufacturing an article comprises the steps of:

rotating/translating the workpiece with respect to a plasma torch (col 5, lines 13-14, fig. 1)

using the plasma fireball to etch the preform/workpiece and to form residual oxide on the preform (col 5, lines 26-27; col 6, lines 35-40), which reads on using reactive atoms plasma processing to add material to the surface of the workpiece and modify the surface with the discharge from the plasma torch

The limitation of claims 2, 5 have been discussed above

Regarding claims 3-4, Fleming discloses that silica formed as vapor material being removed from the silica preform surface (col 6, lines 39-40), which reads on altering the chemistry of the surface of the workpiece. Fleming is also silent about the damage to the workpiece underneath the surface

Regarding claim 6, Fleming discloses the step of exciting the plasma by a RF coil and RF generator (col 4, lines 48-50)

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Regarding claims 7, 26, Fleming discloses placing a discharge gas in a central tube/channel of the plasma torch (fig. 1), using the gas/precursor to control the etch rate (col 9, lines 10-23)

Regarding claims 8-10, Fleming discloses selecting/controlling the flow rate of the etchant in the plasma from 1 l/min (col 7, lines 4-6)

Regarding claim 11, Fleming discloses introducing a gas through a tube 16/outer tube of the plasma torch (fig. 1)

Regarding claim 12, Fleming discloses coupling RF coil/energy to an annular region of the plasma torch (fig. 1)

Regarding claim 16, Fig. 2 of Fleming shows that the plasma gas is introduced tangentially

Regarding claim 17, Fleming discloses maintaining the temperature of the plasma at greater than 9000<sup>0</sup> C (see abstract)

Regarding claim 18, Fleming discloses that the residual oxide can be completely swept away (col 6, lines 40-43)

5. Claims 1, 19 are rejected under 35 U.S.C 102(e) as being anticipated by Seo et al (US 6,534,921)

Seo discloses a method for removing residual material comprises the steps of:  
rotating/translating the workpiece with respect to a plasma jet/torch ( fig. 1)  
using the plasma to deposit the dielectric layer, etching the dielectric layer to form the hard polymer (col 7, lines 15-33), which reads on using reactive atoms plasma

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processing to deposit material on the surface of the workpiece, removing the polymer by the plasma jet (col 7, lines 30-32), which reads on modifying the surface with the discharge from the plasma jet/torch

Regarding claim 19, Seo discloses that the plasma occurs at atmospheric pressure (col 7, lines 48-49)

6. Claim 36 is rejected under 35 U.S.C 102(e) as being anticipated by Seo et al (US 6,534,921)

Seo discloses a method for removing residual material comprises the steps of:

rotating/translating the workpiece with respect to a plasma torch ( fig. 1)

using the plasma to deposit the dielectric layer, etching the dielectric layer to form the hard polymer, transforming the polymer (col 7, lines 15-33), which reads on using reactive atoms plasma processing to deposit and redistribute material on the surface of the workpiece

7. Claims 38-39 are rejected under 35 U.S.C 102(e) as being anticipated by Seo et al (US 6,534,921)

Seo discloses a method for removing residual material using a plasma jet system comprises:

a translator/means for translating /rotating the wafer/workpiece (fig. 1)

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a plasma generator to deposit material on the surface of the wafer/workpiece (col 7, lines 15-20), which reads on means for using reactive plasma processing to deposit material on the workpiece

a plasma jet/plasma torch to remove the polymer from the surface of the wafer/means for modify the surface with the discharge from the plasma torch (col 7, lines 27-30)

### ***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fleming et al (US 5,000,771) in view of Seo et al (US 6,534,921)

Fleming method has been described above. Unlike the instant claimed inventions as per claims 13-15, Fleming fails to disclose the step of introducing an auxiliary gas



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through a second concentric tube to keep hot plasma away from a central channel of the plasma torch/to adjust the position of a discharge

Seo discloses a method for removing residual material using a plasma jet system comprises the step of introducing an a gas through a second tube to cool plasma away from a central channel of the plasma torch (col 10, lines 26-45)

One skilled in the art at the time the invention was made would have found it obvious to modify Fleming method by adding the step of introducing an a gas through a second tube to cool plasma away from a central channel of the plasma torch as per Seo because according to Seo, the gas radical diffuse into the downstream region of the plasma and as the radical diffuse, their temperature cool down through radical expansion in a radial direction, i.e, the cross section of the radial interaction with the wafer/workpiece expands (col 9, lines 40-49)

### ***Conclusion***

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Vinh whose telephone number is 571 272 1471.

The examiner can normally be reached on M-F 8:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571 272 1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to be 'LV', with a long horizontal stroke extending to the right.

LV  
January 31, 2005